

REMARKS

These remarks are in response to the Office Action mailed on May 27, 2003, and for which a three-month extension is hereby requested. The Office Action rejected claims 87-103 under 35 U.S.C. 103(a) as being unpatentable over Iijima (U.S. patent number 5,349,649) in view of MacKenna *et al.* (U.S. patent number 5,495,594). For the reasons given below, the Applicants believe that the pending claims are allowable. As is also described below, several of the claims have been amended, either to make their language more consistent with one another or to further distinguish them from the prior art, and several new claims have been added.

MacKenna et al.

The Office Action introduces the reference of MacKenna *et al.*, U.S. patent number 5,495,594. The Office Action is correct in that "MacKenna et al teaches a peripheral configuring itself to use the protocol used by the host"; however, it is respectfully submitted that it is not accurate when it continues that this configuring is "based solely on the signals present during an initial reset from the host." The Applicants believe that the teachings of Iijima and MacKenna, either alone or in combination, differ from the present invention in a number of ways and that these distinctions are reflected in the pending claims. Further, it is believed that it would not be obvious to combine the teachings of Iijima and MacKenna in the manner suggested by the Office Action.

More specifically, the teachings of MacKenna et al. relate to a peripheral that adapts to the protocol of a microprocessor to which it is attached. The Applicants respectfully submit that the Office Action is incorrect when it state that this adaptation is "based solely on the signals present during an initial reset from the host", where the emphasis has been added to the Office Actions remarks. Nowhere does MacKenna suggest that the peripheral should do anything other than combine logic levels of certain input signals during the first clock cycles after a hardware reset. MacKenna's teachings are based solely on the signals physical levels, not on a communication protocol.

This technique is described briefly in the first sentence of the Abstract ("By monitoring various combinations of control signals generated by a microprocessor in a computer system in the first operational cycles after it is reset, a peripheral circuit sets itself to

respond appropriately to control signals from the microprocessor according to any of several different protocols") and further developed in the Summary beginning at column 3, line 1, with the detailed discussion starting at column 6, line 52.

As described beginning at column 6, line 65, the adaptation is based on a series of latches:

All three latches are cleared/reset when the RESET* signal becomes active.

This occurs at the beginning of any *system* initialization cycle...[emphasis added]

As the description continues, the protocol is determined by monitoring various combinations of control signals (such as shown in Figures 5 and 6), which in turn set the latches. Once the first clock cycle has completed, there is no way to reconfigure the peripheral because the modes are set in latches that can be reset only by the system reset signal from the host. In practice this means rebooting the host and starting over again.

Several things should be noted: A first is that the peripheral does not choose a protocol in response to a specific initialization signal sent from the microprocessor to the peripheral, but rather the latches are cleared based upon the *system reset at power up*, and then the peripheral must monitor the signals sent for other purposes and, based upon the logic levels of these input signals, infer a protocol. A second is that the initialization referred to in MacKenna et al. is a *system* initialization and that the "RESET*" signal upon which it is based is the hardware reset when the system is powered up or rebooted. It is believed that this is clear from a number of places in MacKenna:

This is done by monitoring the signals during the first few operations performed by the microprocessor after initialization or reset *of the computer system*. [column 3, lines 6-8]

The state of several latches is set upon observing the types of signals used by the microprocessor during *its* first operations after initialization. [column 3, lines 22-24]

Circuit 83 learns about the system control signal protocols being utilized during the first cycles of operation *of the system after initialization or reset ...* [column 6, lines 55-57]

and so on, where the emphasis has been added in all cases. In addition to being different than the aspect of the present invention found in the pending claims as described below, where the initialization is a signal from the host to card, it is also respectfully submitted that for these reasons it is not obvious to combine the teachings of MacKenna with those of Iijima, or with memory card usage in general.

The teachings of MacKenna et al. are all based upon the hardware reset that occurs when a system is powered up or rebooted. As these are applied to a peripheral, which is

essentially permanently connected to the microprocessor, this is not a drawback as the peripheral will be connect at power up for the system. Such an arrangement would be extremely limiting for memory card uses, however, and is in many ways contrary to the needs of a card. Much of the utility of a card, which is also a primary aspect of the present invention, is the mobility of a card and the ability to attach and detach a card to and from a host or hosts as needed. Although a card may attached to a host at power up, and the teachings of the present invention also apply in this situation, to limit a card only to this arrangement would require a user to reboot the system every time a card was attached. Consequently, it is respectfully submitted that the teachings of MacKenna et al. do not readily combine with those of Iijima, but rather in many respects teach away from card usage.

Pending Claims

The present invention differs from the prior art and it is respectfully submitted that the pending claims are allowable over the teachings of Iijima and MacKenna et al., taken either individually or in combination. The pending claims are drawn to the aspects of the present invention described on page 5, lines 12-18:

The present invention is directed to a multi-mode card design so that the card according to the present invention is able to communicate with hosts running in different communication protocols. The selection of communication mode is detected and determined by the card at the initialization. Specifically, the host does not need to provide the card with additional mode information. By simply plugging the card to the host, the card can detect, determine, and operate in either one of these two modes of operation.

A number of claims (87, 88, 92, 93, 97, 98, 102, and 103) have been amended to use the terminology "initialization signal", both to be consistent with one another and to avoid confusion with a hardware power up. (Although the present invention is applicable to the power up situation, the currently pending claims are not explicitly drawn to this feature.) Claim 91 has been amended to further delineate its distinctions over the prior art explicitly including language specifying that the card be connected to a host already running. Additionally, claim 92 has been rewritten in independent form and claim 96 has been rewritten to be consistent in language with it base claim, claim 91.

Discussing the claims in order, claim 87 contains the limitation that the protocol is selected "based solely on an initialization command received from the master upon connection to the master". This differs in a number of ways from MacKenna et al.: It is

based on an initialization command from the master to the card, rather than a system reset; the initialization command is received upon connection to the master, rather than requiring that card be connected to master before the entire system (including the card) is powered up or rebooted; and the response is based solely on this command, not a combination of a reset command followed by monitoring signal levels to infer a protocol. The arrangement of the present invention also allows for the host to reissue an initialization command without rebooting the whole system. These limitations are neither taught nor suggested by Iijima or MacKenna et al., either alone or in conjunction. Consequently, a rejection of claim 87 and its dependent claims, claims 88-90, under 35 U.S.C. 103(a) as being unpatentable over Iijima in view of MacKenna *et al.* is respectfully submitted to be in error and should be withdrawn.

Concerning claim 88, as described above MacKenna et al. use a system reset signal followed by the peripheral monitoring a number of logic levels. This differs from claim 88: "wherein said *initialization command* comprises asserting a first signal level to a first connection pins when the host operates in the first protocol and not asserting said the first signal level to the first connection pins when the host does not operate in the first protocol." [emphasis added] It is based on this initialization signal, not the monitoring of a subsequent set of logic levels, that the protocol is chosen.

With respect to claim 89, MacKenna et al. does describe the use of a chip select signal, CS, at column 5, lines 52-60, and elsewhere; however, neither MacKenna et al. nor Iijima suggest the use of a chip select signal for determination of a protocol, as is described in claim 89: "wherein said asserting a first signal level [of which the initialization command is comprised] is the assertion of a chip select signal and wherein the first protocol is a Serial Peripheral Interface protocol."

Concerning claim 90, the Office Action takes "Official notice ... that ... the MultiMediaCard protocol [is a] well known standard protocol" and states that "It would have been obvious to a person of ordinary skill in the art at the time of the invention to support [this] protocol". It is respectfully submitted that assumptions have improperly been made by the Examiner as to what one ordinarily skilled in the art *at the time of the invention* would have found obvious to do since there is no supporting evidence provided in the Office Action that the MultiMediaCard protocol was a well known standard protocol at the time and that supporting it would have been obvious.

Independent claim 91, which has been amended to make more explicit its distinctions from the prior art, is believed allowable for reasons similar to those given above with respect to claim 87. More specifically, claim 91 describes a system of a "host *operating* in a first ... protocol" and a card that selects this protocol "in a way transparent to the host *upon connection* to the host." As the added emphasis indicates, claim 91 is drawn to the aspect of the present invention whereby the card can be connected to a running host and select the host protocol, in contrast to the teachings of MacKenna et al., which would require the system to be rebooted. Claim 96 depends upon claim 91 and adds a second card that also selects the protocol of the operating host "in a way transparent to the host *upon connection* to the host" and is further believed allowable for this reasons. Consequently, a rejection of claims 91 and 96 under 35 U.S.C. 103(a) as being unpatentable over Iijima in view of MacKenna et al. is respectfully submitted to be in error and should be withdrawn.

Claim 92 has been rewritten by incorporating (original) claim 91, upon which it formerly depended. Claim 92 contains the limitation that "the first card selects the first protocol *in response to an initialization signal* from the host *when the first card is connected* to the host", where the emphasis has been added, and is consequently believed allowable for the reasons described above with respect to claim 87. Dependent claims 93-95 are further believed allowable for the reasons given above with respect to claims 88-90, respectively. Consequently, a rejection of claims 92-95 under 35 U.S.C. 103(a) as being unpatentable over Iijima in view of MacKenna et al. is also respectfully submitted to be in error and should be withdrawn.

Independent claim 97 is a corresponding method claim:

A method comprising:
 connecting a first memory card capable of communicating in a plurality of communication protocols *to a first host operating* in a first of said plurality of communication protocols;
 in response to said connecting the first memory card to the first host,
 transmitting an initialization command from the first host to the first card;
 receiving the initialization command in the first card; and
 the first memory card selecting the first communication protocol for the transfer of data and commands between the first host and the first memory card *based solely on the initialization command*.

The emphasis has been added to highlight elements described above whereby the present invention differs from the teaching of Iijima and MacKenna et al., namely that the card is connected to a host already operating, instead of requiring a reset or reboot of the system; that


the initialization is in response to connecting the card; that the initialization command is *from* the host *to* the card, as opposed to a combination of a system reset followed by the card monitoring the logical levels of other signals the host puts out; and that the card selects the protocol "based solely on the initialization command". For any of these reasons, it is respectfully submitted that the rejection of claim 97 and dependent claims 98-103 is not well founded and should be withdrawn. Claims 98 and 101 are further believed allowable for the reasons respectively given above for claims 89 and 90. Claims 102 and 103 are further believed allowable as they reiterate many of the limitations emphasized for claim 97, but further applied, respectively, to a second host and a second card.

New independent claim 104 is drawn to the aspect of the present invention that allows for the host reissue an initialization command without rebooting the whole system, as described above. New claims 105-107 depend upon claim 104, adding limitations similar to those found in a number of the other pending dependent claims.

Conclusion

For these reasons, claims 87-103 are believed allowable. Reconsideration of these claims, and consideration of new claims 104-107, is therefore respectfully requested and an early indication of their allowability is earnestly solicited.

Respectfully submitted,


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November 24, 2003
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